

PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF
ENGINEERING & TECHNOLOGY, BARGARH



LESSON PLAN
Session-2024-2025

Semester: Second Discipline: All Engg.

Subject: Applied chemistry. (TH-5)

Name of the Teaching Faculty: Dr. Seelkh Abied Hussaini

Subject: Applied Chemistry No. of Days/per week class allotted: 04

Semester From Date: 04.02.2025 To Date: 21.02.2025 No. of Weeks: 17

Week	Class Day	Theory /Practical Topics
1st	1st	Rutherford model of atom
	2nd	Bohr's theory and hydrogen spectrum explained based on Bohr's model of atom.
	3rd	Heisenberg uncertainty principle, Quantum numbers, orbital concept.
	4th	shapes of s, p, and d-orbitals.
2nd	1st	pauli's exclusion principle, Hund's rule of maximum multiplicity, Aufbau rule, electronic configuration.
	2nd	Cause of chemical bonding, types of bonds, ionic bonding.
	3rd	covalent bond
	4th	co-ordinate bond in NH_4^+ and anomalous properties of NH_3 , H_2O due to hydrogen bonding
3rd	1st	metallic bonding.
	2nd	Solution:- idea of ^{solute} solvent and solution methods to express the concentrations of solution.
	3rd	molarity, ppm, mass percentage, volume percentage and mole fraction.
	4th	water:- Graphical presentation of water distribution on earth by pie or bar chart, classification of soft and hard water based on soap test.

Ahsani
Signature of the Faculty

Subject: Applied ChemistryNo. of Days/per week class allotted: 04Semester From Date: 22.02.2025To Date: 08.03.2025No. of Weeks: 17

Week	Class Day	Theory / Practical Topics
1 st	1 st	Salts causing water hardness, unit of hardness and simple numerical or water hardness.
	2 nd	Cause of poor lathering of soap in hard water, problem caused by the use of hard water in boiler, quantitative measurement of hardness by EDTA method.
	3 rd	total dissolve solids (TDS), alkalinity estimation.
	4 th	water softening technique by Soda lime process, zeolite process and ion exchange process.
5 th	1 st	Municipal water treatment by sedimentation, coagulation, filtration, sterilization.
	2 nd	water for human consumption for drinking and cooking purposes from any water source and enlisting Indian standard specification for drinking water.
	3 rd	Engineering material: - natural occurrence of metal minerals, ores of iron, aluminium and copper, gangue, flux, slag.
	4 th	Brief account of general principle of metallurgy
6 th	1 st	Extraction of iron from haematite ore using blast furnace,
	2 nd	Extraction of aluminium from bauxite ore along with reaction.
	3 rd	Alloy - definition, purposes of alloying, ferrous alloys and non ferrous with examples purposes and application.
	4 th	General chemical composition, composition based applications of portland cement and hardening.

G. Srinivas
Signature of the Faculty

Subject: Applied ChemistryNo. of Days/per week class allotted : 04Semester From Date : 10.03.2025 To Date: 29.03.2025 No. of Weeks : 11

Week	Class Day	Theory / Practical Topics
1 st	1 st	Glasses Refractory and composite material
	2 nd	Polymers :- Monomers, homo and co-polymers, degree of polymerization, simple reactions involved in preparation and their application
	3 rd	Preparation and their application of thermoplastic and thermosetting plastic using PVC, PS, PTFE Nylon-6, nylon-6,6 and Bakelite.
	4 th	Rubber and vulcanization of rubber.
2 nd	1 st	Definition of fuel and combustion of fuel, classification of fuels, calorific values HCV and LCV, calculation of HCV and LCV using Dulong's formula.
	2 nd	Proximate analysis of coal.
	3 rd	Petrole and diesel - fuel rating (Octane and Cetane number)
	4 th	Chemical composition, calorific values and application of LPG, CNG, water gas, coal gas producer gas and biogas.
3 rd	1 st	Lubrication :- Function and characteristic properties of good lubricant, classification with example.
	2 nd	Lubrication mechanism - hydrodynamic and boundary lubrication, physical properties like viscosity, viscosity index, oiliness, flash point
	3 rd	Cloud and pour point and chemical properties like color number, total acid number saponification value.
	4 th	<u>Electrochemistry :-</u> Electrochemical concept of oxidation, reduction and redox reaction.

Ansam
Signature of the Faculty

Subject: Applied ChemistryNo. of Days/per week class allotted: 04Semester From Date: 02.04.2025 To Date: 19.04.2025 No. of Weeks: 17

Week	Class Day	Theory / Practical Topics
10th	1st	Definition of terms: - electrolytes, non-electrolyte with suitable example.
	2nd	Faradays law of electrolysis and simple numerical problems.
	3rd	Industrial application of Electrolysis like Electrometallurgy - Electroplating and electrorefining.
	4th	Application of redox reaction and electrochemical cells.
11th	1st	primary cell - dry cell, Secondary cell - Commercially used lead storage battery, fuel cell.
	2nd	Solar cell.
	3rd	Definition of corrosion, types of corrosion Chemical and electrochemical.
	4th	H ₂ liberation and O ₂ absorption mechanism of electrochemical corrosion.
12th	1st	Factors affecting rate of corrosion.
	2nd	Internal corrosion prevention measures like purification, alloying and heat treatment
	3rd	External corrosion preventive measures like metal (cathodic, anodic) organic inhibitors
	4th	projects model of molecules BeCl ₂ , BF ₃ , CH ₄ , NH ₃ , H ₂ O.

A. S. S.
Signature of the Faculty

Subject: Applied Chemistry,No. of Days/per week class allotted: 04Semester From Date: 21.04.2025To Date: 10.05.2025No. of Weeks: 12

Week	Class Day	Theory/Practical Topics
13th	1st	Project:- collection of water sample from different water sources and measure of hardness.
	2nd	Project:- Making table showing place of availability of different ores in India.
	3rd	Project:- Mapping of energy resources in India.
	4th	Project:- collection of data of various lubricants available in the market.
14th	1st	Project:- Mapping of area in India prone to corrosion.
	2nd	collection of data of various electrochemical cells, batteries used in equipment and device.
	3rd	Project:- study of corrosion area in railways and.
	4th	and Revision of unit-1
15th	1st	class test of unit-1
	2nd	Revision of unit-2
	3rd	Class test of unit-2
	4th	Revision of unit-3

Arshini
Signature of the Faculty

